

Remarks/Arguments:

This is a reply to the office action of October 5, 2004, in which elected claims 1 - 14 were rejected under section 112 of the statute for formal reasons, and as anticipated by, or in the alternative obvious over, EP 203 206.

The claims have been revised to comply with section 112. Claim dependency has been changed accordingly. Non-elected claims 15 and 16 have been canceled. A preferred feature of claim 1 has been placed in new dependent claim 17, and the dependency of certain other dependent claims has been corresponding changed.

Claim 18 is a new independent claim.

The rejections over prior art are respectfully traversed, for reasons set out below.

The present invention aims to provide a filter cartridge with which the performance of a precoat cartridge filter may be increased (see paragraph 0007). Since, in beer production, large amounts of liquids need to be filtered, it is economically of great interest to increase filtration performance without increasing the outer size of the filter system. The inventors of the present application have found it possible to increase the filtration performance of a cartridge filter if the product of the cartridge diameter (in mm) and the cartridge spacing (in mm) is between 1000 mm² and 2300 mm². For a cartridge filter to have these properties, it is most important that the filter cartridges are thin, i.e. their diameter is below 30 mm, so that the spacing between the cartridges can be chosen suitably to allow a layer of filter aid to be formed on the cartridge.

Another object is to provide a filter cartridge which is also suitable for retrofitting existing horizontal filter systems with cartridge filters. As horizontal filter systems have a predefined size, it was not previously possible to replace the horizontal filter plates with filter cartridges, without a significant decrease of the filtration surface and

thus performance.

These above objects are achieved with a filter cartridge according to claim 1. The prior art does not motivate someone skilled in the art to produce a filter cartridge having a diameter of less than 30 mm. Knowledge of technical problems in the production of filter cartridges has discouraged those skilled in the art from producing such a filter cartridge, and the prior art does not render obvious the filter cartridge described by claim 1.

Claim 1 is novel over EP 203 206, because that document discloses only filter cartridges having a diameter of more than 30 mm, the maximum diameter recited in claim 1. Furthermore, the invention of claim 1 would not have been obvious to a person of ordinary skill in the art, from EP 203 206.

According to the enclosed Declaration of John Desmet, someone skilled in the art would have been led away from making a filter cartridge having a diameter of less than 30 mm due to several technical drawbacks. He would thus not have considered such a filter cartridge as a possible solution to improve the properties of a precoat cartridge filter.

As Mr. Desmet explains, as filter cartridges are scaled down, certain quality problems arise, in particular deformation of the structure (axial and/or profile) and loss of stability. The solution to this problem is not obvious. The declaration states that EP 203 206 related only to cartridges having a diameter of more than 30 mm, and that following that patent's teachings would not have solved the stability and deformation problems observed in smaller devices. Thus, the invention of claim 1 is not a "mere" (and thus unpatentable) change in size of a prior art structure. The present invention teaches one how to obtain the benefits of smaller filter cartridges, in a way which the prior art does not predict.

New claim 12 is also nonobvious. In a filter cartridge having a diameter of less than 30 mm, a further problem is that the holding elements occupy a relatively high percentage of the inner volume of the cartridge. To overcome this problem, the holding elements – described in claim 12 – have a cross-sectional taper oriented radially inwards. There is no indication given in EP 203 206 that such a problem could occur and that it could be solved in such a way. Thus, it is not obvious to provide filter cartridges having a diameter of less than 30 mm, where the holding elements are provided with a cross-sectional taper oriented inwards.

Without discussing the dependent claims in detail, we submit that each contains limitations which, taken with those of the parent claims(s), further distinguish the invention from the prior art, and would be allowable even if the parent claims were not.

We conclude that the invention now claimed meet the requirements for patentability, and that the application as now presented is in condition for allowance.

A petition for an extension of time accompanies this amendment.

Respectfully submitted,



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February 4, 2005

I certify that this correspondence is being transmitted to the Patent and Trademark Office on February 4, 2005 by facsimile to 703.872.9306.

